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(54) **A PRESS PAD**

PRESSPOLSTER

COUSSINET POUR PRESSE

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(56) References cited:

EP-A- 0 235 582	DE-A- 2 627 442
DE-A- 2 650 642	DE-U- 9 115 681
DE-U- 9 418 984	FR-A- 2 226 273
FR-A- 2 239 340	

- PATENT ABSTRACTS OF JAPAN vol. 012, no. 105 (M-681), 6 April 1988 & JP,A,62 234696 (MATSUSHITA ELECTRIC WORKS LTD), 14 October 1987,
- PATENT ABSTRACTS OF JAPAN vol. 012, no. 105 (M-681), 6 April 1988 & JP,A,62 234698 (MATSUSHITA ELECTRIC WORKS LTD), 14 October 1987,

EP 0 735 949 B1

Description

The present invention relates to a press pad for use in a laminating press for the production of laminate sheets, such as decorative laminates and printed circuit boards, using low pressure and high pressure single daylight and multi daylight presses.

As shown in Fig. 4 of the drawings appended hereto, in a single daylight laminating press, a laminate sheet 1 to be pressed between two platens 2 of the press is located between two metal caul plates 3 and two press pads 4. The press pads 4 are each located between one of the caul plates 3 and one of the platens 2. The press pads 4 are usually a little larger than the dimensions of the platen 2 to allow for clamping.

The purpose of the press pads 4 is to compensate for density variations in the laminate sheet 1 and thereby ensure that an equal pressure is applied to all parts of the sheet 1. In addition, the press pads 4 compensate for any unevenness in the surfaces of the platens 2 of the press itself and any flexure or bowing of the platens 2 when under pressure. Again, this assists in the production of a flat even density laminate. Thus, it is important for a press pad to be resilient and have a natural springiness to permit it to compensate for the aforementioned density variations and the surface unevenness of the press platens but also to allow it to relax after each pressing operation and recover its form to enable it to be used again. The capacity a press pad has to re-form itself after each pressing is an important characteristic to ensure a reasonable working life and to avoid unnecessary downtime of a press whilst the press pads are replaced.

However, because the purpose of the press is to apply heat to the laminate sheet whilst it is under pressure, it is important that the press pad also conducts the heat supplied by the press platens to the laminate sheet. Working temperatures for such presses are usually in a range up to 220°C.

Typically, therefore, a conventional press pad is a densely woven combination of high temperature resistant non-asbestos yarns and metal wire. The metal wire is included to give good heat transmission through the pad to the laminate sheet. In contrast, the non-metal yarn is required to give the pad the springiness and resilience required to enable the pad to relax after each pressing operation. The relative proportion of the two types of material is a consideration when devising a press pad for a particular purpose. Usually a compromise must be reached between the heat transference and the resilience required in each case.

The metal wires used are typically copper of brass wire whereas the temperature resistant yarns are usually made from aromatic polyamide fibres such as those manufactured and marketed by Du Pont Inc under the trade marks KEVLAR and NOMEX. Whilst metal wires can be woven per se, it is also common for metal strands to be wrapped around heat resistant yarns and for heat resistant yarns to be wrapped around metal strands. Metal wires may also be sheathed with textile fibres.

A conventional press pad for use in a high pressure daylight press is described in EP 0 493 630 A1. Here, the press pad is made from a woven textile of aromatic polyamide and metal threads.

Another press pad is described in EP 0 488 071 A2. This also is made from a combination of heat resistant organic fibres, such as aramide fibres, phenol fibres, polyetheretherketone fibres, and polyphenylsulfone fibres, and heat resistant inorganic fibres such as carbon fibres, glass fibres and metallic fibres.

One of the problems encountered with these conventional press pads is that in use, the metal threads eventually flatten the weave structure to such an extent that the press pad is unable to relax after each pressing operation and the pad loses its resilience and springiness. In contrast, pads are known which do not comprise metal threads but these suffer from the disadvantage that their heat transmission properties are poor. Examples of such pads are as follows.

In JP,A,62 234696 and JP,A,62 234698 are disclosed press pads comprising plates, sheets, woven fabrics and non-woven fabrics of thermoplastic resin such as polyamide resin, polyimide resion, polyfluororesin and silicone resin used alone or in combination.

FR,A,2 239 340 discloses a pad wherein glass fibre threads are impregnated with a synthetic material which may comprise a silicone rubber. The impregnation is accomplished by covering the warp or weft threads, or by impregnating the pad after weaving, or both. However, this pad has been specifically designed to have a low coefficient of thermal expansion.

Whilst the springiness of these last two types of pad may be high, their low thermal conductivity means that they act in use as a heat brake and therefore reduce the power of the press.

Another problem with conventional press pads is that once a pad has been used for pressing a particular size and format of laminate sheet, it is generally not possible to use the pad again with sheets of a larger size or different format without leaving marks on the subsequently pressed sheets.

It is an object of the invention to provide a press pad which has a greater resilience and springiness over conventional pads and for a longer period without compromising the heat conduction capability of the pad. In addition, it is an object of the present invention to provide a press pad which mitigates the effect of format changes in the laminate sheets being pressed.

According to the present invention there is provided a press pad for use in a laminate press comprising a woven fabric of heat resistant strands including metal wire and characterised in that a substantial proportion of at least one of the warp and the weft comprises a silicone elastomer.

The advantage of using a silicone elastomer in a press pad is that it provides a high degree of springiness and resistance to compressive loads which means

that the springiness and resilience of the pad is not solely dependent on its weave structure. Thus, a press pad according to the invention can be used for a longer period than a similarly woven conventional pad before losing its compensating ability. In addition, format changes in the laminate sheets being pressed can be more readily accommodated.

In addition, it is also anticipated that if the silicone in the press pad is cut by the metal wires which are also present in the pad, the springiness of the pad will not be significantly affected. This is in contrast to conventional pads wherein the metal wires can cut the other non-metal yarns, to the detriment of the springiness of the pad.

The silicone elastomer preferably has a specific gravity within the range of 1.1 g/cm^3 to 1.4 g/cm^3 inclusive. More particularly, however, the silicone elastomer advantageously has a specific gravity of 1.20 ± 0.02 g/cm^3. Silicone elastomers within this latter range exhibit the best qualities for this application, combining the properties of a long working life, high tear strength and a good resilience to compression.

Preferably, at least one of the warp and the weft comprises silicone covered metal wire. Alternatively, at least one of the warp and the weft comprises substantially solid silicone strands.

Preferably also, the wall thickness of the silicone of the silicone covered wire is at least 0.2 mm, and the overall outside diameter of the silicone covered wire is at least 1.0 mm.

Preferably also, the silicone covered wire comprises a stranded or braided copper wire wherein the diameter of each wire strand is at least 0.05 mm.

Preferably also, the silicone covered wire comprises a stranded wire made up from at least 7 wire strands.

Preferably also, the other of the warp and the weft from that which comprises the silicone elastomer, comprises strands of a copper alloy.

The present invention will now be described by way of example with reference to the accompanying drawings, in which:-

Figs. 1a to 3a are cross-sections of three examples of weaves for use in the manufacture of press pads according to the invention;

Figs. 1b to 3b are weave pattern diagrams for the weaves shown in Figs. 1a to 6a respectively; and

Fig. 4 is a diagram showing the conventional arrangement of a laminate sheet and press pads in a single daylight press.

A press pad for use in a laminate press comprises a densely woven fabric which is made of materials that are heat resistant to at least 220°C. A substantial proportion of at least either the weft or the warp or both are strands comprising a silicone elastomer. The rest of the warp and weft not made of this material is made substantially of metal, either in the form of wire, which can be stranded or otherwise, or as a wrapping for a heat resistant yarn such as an aromatic polyamide yarn.

Preferably, the weft comprises a silicone covered wire, such as copper wire. For example, a suitable silicone covered wire may be a silicone covered nickel plated copper wire. However, it is also envisaged that the weft could comprise solid silicone strands.

The type of silicone elastomer used is important in order to secure the host properties for the performance of the press pad made therefrom. Silicone elastomers with a specific gravity within the range of 1.1 g/cm^3 to 1.4 g/cm^3 inclusive can be used but in order to secure the best properties wherein it is neither sufficiently springy under compression nor too brittle, the silicone elastomer preferably has a specific gravity of 1.20 ± 0.02 g/cm^3 with a hardness of 70 ± 5 IRHD. In addition it is preferably a high tear strength elastomer, for example with a minimum tear strength of 15 kN per metre and a minimum tensile strength of 6MPa. Such a silicone elastomer is cut-resistant and capable of operating continuously at working temperatures of up to 220°C. In addition, it is capable of withstanding and recovering from pressures in the range 20 kg per cm^2 to 120 kg per cm^2 for a pressing time in the range of 15 seconds to 120 minutes as can be found in laminate presses of various types.

If silicone covered wire is used in the weft, the wall thickness of the silicone is preferably at least 0.2 mm and the overall outside diameter of the silicone covered wire is at least 1.0 mm. Stranded or braided wire can also be used wherein the wire preferably comprises at least 7 wire strands.

Such silicone covered wire can be made in a conventional manner, preferably by being extruded over either a solid metal wire or d stranded metal wire. In addition, if silicone covered copper wire is used, the copper wire can be plated to prevent oxidisation of the copper. For example, as indicated above a suitable silicone covered wire may be a silicone, covered nickel plated copper wire such as is commonly used for electrical wiring. Alternatively, for the reason mentioned below, the wire may comprise stainless steel wire to overcome any problems associated with metal fatigue.

However, these problems may also be overcome by using multi-stranded copper wire which exhibits a high reversed bending strength and therefore has a lower susceptibility to metal fatigue and a greater flexibility than the conventional copper wire used for electrical wiring. Here, for example, up to 102 strands of copper wire, each of at least 0.05 mm can be covered with silicone as previously described to produce a wire of similar exterior dimensions to those previously described. Alternatively, for example, a silicone covered multi-stranded copper wire with up to 66 strands of copper wire, each of at least 0.07 could be used.

With regard to the warp strands of the pad, soft annealed copper wire is conventionally used in press

pads because it is ductile and easily made into strands suitable for weaving, and it is a good heat conductor. Other metals such as aluminium, and alloys such as brass, may also be used. Whilst such metal strands can also be used in a press pad according to the present invention, it has been found that in view of the high degree of compensation present in the press pad, wherein the metal strands in the pad are repeatedly flattened out during pressing and sprung back to regain their former position by the natural springiness of the silicone elastomer after each pressing operation, the metal strands can in time exhibit the symptoms of metal fatigue. Soft annealed copper is susceptible in this regard. Hence, it is envisaged that, dependent on the particular application of the press pad, other metals which exhibit a better resistance to metal fatigue may be used either wholly or in part to form the warp strands of the pad. For example, stainless steel strands or copper alloys may be used, in particular alloys of copper with a heavy metal such as cadmium and zirconium, or with iron.

Such copper alloys wherein the proportion of the second metal is small in comparison to the whole, for example copper cadmium alloys wherein the proportion of cadmium is approximately 1 % of the whole, exhibit a higher reversed bending strength than soft annealed copper without significantly compromising the heat conductive properties of the metal and therefore the pad. The compensation ability of the pad is therefore ameliorated by the additional springiness of the copper alloy when compared with the relative maleability of soft annealed copper.

Non-metal strands, such as aromatic polyamide yarns or polyester yarns, may also be used to form the warp strands. In addition, metal strands such as copper or stainless steel strands may be wrapped with an aromatic polyamide yarn in a conventional manner.

Stainless steel strands may also be used to braid the exterior of silicone covered copper wire which may be used in the weft to improve its resistance to metal fatigue. Such braided strands could also be used in the warp of the weave.

It will be appreciated that although the types of strands used in the warp and in the weft have been differentiated as described above, it is possible for the warp to comprise substantially the silicone elastomer and the weft to comprise substantially metal strands or other heat resistant yarns.

Three examples of weaves suitable for use in the manufacture of a press pad will now be described with reference to the drawings. However, it will be appreciated that many other types of weave could be used.

The selection of one particular press pad over another depends largely on the type of pressing operation in which the pad is to be used. In all the given examples, the weft threads *A* each comprise a silicone covered stranded copper wire as is described above, which may be braided with stainless steel wire if appropriate for the application. The warp threads *B* preferably comprise one of stainless steel wires, copper wires, copper wires wrapped with an aromatic polyamide yarn in a conventional manner, aromatic polyamide yarn, or polyester yarn.

The weave cross-sections and the weave diagrams illustrating these examples are shown in a conventional manner. In the weave cross-sections comprising Figs. 1a to 3a, it is the weft which is shown in cross section with the warp interweaving therebetween. In the weave diagrams comprising Figs. 1b to 3b, the "vertical" lines represent the warp and the "horizontal" lines represent the weft; at each intersection between the warp and the weft a filled-in or crossed square indicates that the warp is placed above the weft whereas a blank square indicates that the weft is above the warp. In all cases, the weave diagrams show at least one round of weave.

<u>Example 1</u>

This weave is shown in Figs. 1a and 1b and comprises a single ply plain weave. The characteristics of this weave are as follows.

Number of warp threads per decimetre
45 to 65
Number of weft threads per decimetre
30 to 47
Weight of woven fabric (g/m^2)
2000 to 5000
Thickness of woven fabric (mm)
1.5 to 2.5

<u>Examples 2 and 3</u>

Single ply simple twill weaver ore shown in Figs. 2a and 3a with their corresponding weave diagrams in Figs. 2b and 3b. Here, the warp strands pass over and under more than one weft strand it a time. In a 2/2 twill weave, as shown in Figs. 2a and 2b the warp threads *B* pass alternatively under and over two weft threads *A* and the woven fabric has the same amount of warp material on the both faces of the fabric, which thus presents the same appearance on both sides. Likewise, in a 3/3 twill weave, as shown in Figs. 3a and 3b the warp strands *B* pass alternatively under and over three weft strands *A*.

Twill weaves have the advantage of providing a highly flexible press cushion with a smoother surface than other weaves. This is advantageous in some applications.

The characteristics of both the 2/2 and 3/3 twill weaves are as follows.

Number of warp threads per decimetre
60 to 75
Number of weft threads per decimetre
30 to 55
Weight of woven fabric (g/m^2)
2000 to 5000

Thickness of woven fabric (mm)
2.0 to 3.0

Claims

1. A press pad for use in a laminate press comprising a woven fabric of heat resistant strands including metal strands and characterised in that a substantial proportion of at least one of the warp (*B*) and the weft (*A*) comprises a silicone elastomer.

2. A press pad as claimed in Claim 1, characterised in that the silicone elastomer has a specific gravity within the range of 1.1 g/cm^3 to 1.4 g/cm^3 inclusive.

3. A press pad as claimed in Claim 1 or Claim 2, characterised in that the silicone elastomer has a specific gravity of 1.20 ± 0.02 g/cm^3.

4. A press pad as claimed in Claim 2 or Claim 3, characterised in that the silicone elastomer has a minimum tear strength of 15 kN per metre and a minimum tensile strength of 6MPa.

5. A press pad as claimed in any one of claims 1 to 4, characterised in that at least one of the warp (*B*) and the weft (*A*) comprises substantially solid silicone strands.

6. A press pad as claimed in any one of Claims 1 to 4, characterised in that at least one of the warp (*B*) and the weft (*A*) comprises silicone covered metal wire.

7. A press pad as claimed in Claim 6, characterised in that the wall thickness of the silicone of the silicone covered wire is at least 0.2 mm, and the overall outside diameter of the silicone covered wire is at least 1.0 mm.

8. A press pad as claimed in Claim 6 or Claim 7, characterised in that the silicone covered metal wire comprises a stranded or braided copper wire wherein the diameter of each wire strand is at least 0.05 mm.

9. A press pad as claimed in any one of Claims 6 to 8, characterised in that the silicone covered metal wire comprises a stranded wire made up from at least 7 wire strands.

10. A press pad as claimed in any one of Claims 6 to 9, characterised in that the exterior of the silicone covered metal wire is covered by braided stainless steel wire.

11. A press pad as claimed in any one of Claims 1 to 10, characterised in that the other of the warp (*B*) and the weft (*A*) from that which comprises the silicone elastomer, comprises strands of a copper alloy.

12. A press pad as claimed in Claim 11, characterised in that the copper alloy comprises an alloy of copper with at least one of cadmium, zirconium, and iron.

13. A press pad as claimed in any one of Claims 1 to 4, characterised in that the weft (*A*) comprises strands which comprise a silicone elastomer and in that the warp (*B*) comprises at least one of stainless steel wires, copper wires, copper alloy wires, copper wires wrapped with an aromatic polyamide yarn, stainless steel wires wrapped with an aromatic polyamide yarn, aromatic polyamide yarn, and polyester yarn.

14. A press pad as claimed in Claim 13. characterised in that the weft (*A*) comprises silicone covered copper wire.

Patentansprüche

1. Preßpolster zur Verwendung in einer Schichtstoffpresse, das ein textiles Gewebe aus warmfesten Fäden, welche Metallfäden umfassen, aufweist,
dadurch gekennzeichnet,
daß ein erheblicher Anteil von wenigstens einer von Kette (B) und Schuß (A) ein Siliconelastomer aufweist.

2. Preßpolster nach Anspruch 1,
dadurch gekennzeichnet,
daß das Siliconelastomer eine Dichte im Bereich von 1,1 g/cm^3 bis 1,4 g/cm^3 einschließlich hat.

3. Preßpolster nach Anspruch 1 oder 2,
dadurch gekennzeichnet,
daß das Siliconelastomer eine Dichte von 1,20 ±0,02 g/cm^3 hat.

4. Preßpolster nach Anspruch 2 oder 3,
dadurch gekennzeichnet,
daß das Siliconelastomer eine Mindestreißfestigkeit von 15 kN/m und eine Mindestzugfestigkeit von 6 MPa hat.

5. Preßpolster nach einem der Ansprüche 1 bis 4,
dadurch gekennzeichnet,
daß wenigstens eine von Kette (B) und Schuß (A) im wesentlichen Silicon-Vollfäden aufweist.

6. Preßpolster nach einem der Ansprüche 1 bis 4,
dadurch gekennzeichnet,
daß wenigstens eine von Kette (B) und Schuß (A) siliconummantelten Metalldraht aufweist.

7. Preßpolster nach Anspruch 6,

dadurch gekennzeichnet,
daß die Siliconwandstärke des siliconummantelten Drahts wenigsten 0,2 mm und der Gesamtaußendurchmesser des siliconummantelten Drahts wenigstens 1,0 mm ist.

8. Preßpolster nach einem der Ansprüche 6 oder 7,
dadurch gekennzeichnet,
daß der siliconummantelte Metalldraht einen verlitzten oder geflochtenen Kupferdraht aufweist, wobei der Durchmesser jeder Drahtlitze wenigstens 0,05 mm ist.

9. Preßpolster nach einem der Ansprüche 6 bis 8,
dadurch gekennzeichnet,
daß der siliconummantelte Metalldraht einen verlitzten Draht aufweist, der aus wenigstens sieben Drahtlitzen besteht.

10. Preßpolster nach einem der Ansprüche 6 bis 9,
dadurch gekennzeichnet,
daß die Außenseite des siliconummantelten Metalldrahts mit geflochtenem rostfreiem Stahldraht bedeckt ist.

11. Preßpolster nach einem der Ansprüche 1 bis 10,
dadurch gekennzeichnet,
daß die andere von Kette (B) und Schuß (A), die das Siliconelastomer nicht aufweist, Litzen aus einer Kupferlegierung aufweist.

12. Preßpolster nach Anspruch 11,
dadurch gekennzeichnet,
daß die Kupferlegierung eine Legierung aus Kupfer mit wenigstens einem von Cadmium, Zirconium und Eisen aufweist.

13. Preßpolster nach einem der Ansprüche 1 bis 4,
dadurch gekennzeichnet,
daß der Schuß (A) Fäden aufweist, die ein Siliconelastomer umfassen, und daß die Kette (B) wenigstens eines von rostfreien Stahldrähten, Kupferdrähten, Kupferlegierungsdrähten, Kupferdrähten, die mit einem aromatischen Polyamidfaden umwickelt sind, rostfreien Stahldrähten, die mit einem aromatischen Polyamidfaden umwickelt sind, aromatischem Polyamidgarn und Polyestergarn aufweist.

14. Preßpolster nach Anspruch 13,
dadurch gekennzeichnet,
daß der Schuß (A) siliconummantelten Kupferdraht aufweist.

Revendications

1. Coussinet pour presse pour utilisation dans une presse à laminer, comprenant un textile tissé de fils résistant à la chaleur et comprenant des fils métalliques caractérisé en ce qu'une partie substantielle d'au moins la chaîne (B) ou la trame (A) comprend un élastomère de silicone.

2. Coussinet pour presse selon la revendication 1 caractérisé en ce que l'élastomère de silicone présente un poids volumique s'étendant de 1,1 g/cm^3 à 1,4 g/cm^3 inclusivement.

3. Coussinet pour presse selon la revendication 1 ou la revendication 2, caractérisé en ce que l'élastomère de silicone présente un poids volumique de 1,20 ± 0,02 g/cm^3.

4. Coussinet pour presse selon la revendication 2 ou la revendication 3, caractérisé en ce que l'élastomère de silicone présente une résistance au déchirement par traction de minimum 15 kN par mètre et une résistance à la rupture par traction de minimum 6 MPa.

5. Coussinet pour presse selon n'importe laquelle des revendications 1 à 4, caractérisé en ce qu'au moins la chaîne (B) et la trame (A) comprend essentiellement des fils de silicone solide.

6. Coussinet pour presse selon n'importe laquelle des revendications 1 à 4, caractérisé en ce qu'au moins la chaîne (B) et la trame (A) comprend un fil métallique recouvert de silicone.

7. Coussinet pour presse selon la revendication 6, caractérisé en ce que l'épaisseur de la paroi de silicone du fil recouvert de silicone est d'au moins 0,2 mm, et le diamètre total du fil recouvert de silicone est d'au moins 1,0 mm.

8. Coussinet pour presse comme revendiqué dans la revendication 6 au dans la revendication 7 caractérisé en ce que le fil de métal recouvert de silicone comprend un fil de cuivre toronné ou tressé dans lequel le diamètre de chaque brin est d'au moins 0,05 mm.

9. Coussinet selon n'importe laquelle des revendications 6 à 8 caractérisé en ce que le fil de métal recouvert de silicone comprend un fil toronné composés d'au moins 7 brins.

10. Coussinet pour presse selon n'importe laquelle des revendications 6 à 9, caractérisé en ce que l'extérieur du fil métallique recouvert de silicone est recouvert de fil métallique inoxidable tressé.

11. Coussinet pour presse selon n'importe laquelle des revendication 1 à 10, caractérisé en ce que la chaîne (B) ou la trame (A) ne comprenant pas l'élastomère de silicone, comprend des fils d'un alliage de cuivre.

12. Coussinet pour presse selon la revendication 11, caractérisé en ce que l'alliage de cuivre comprend un alliage de cuivre avec au moins soit du cadmium, du zirconium ou du fer.

13. Coussinet pour presse comme revendiqué dans n'importe laquelle dos revendications 1 à 4 caractérisé en ce que la trame (A) comprend des fils qui comprennent un élastomère de silicone et en ce que la chaîne (B) comprend au moins soit des fils métalliques inoxydables, des fils de cuivre, des fils d'alliage de cuivre, des fils de cuivre recouverts avec des fils de polyamide aromatique, des fils métalliques inoxydables enveloppés de fils de polyamide aromatique, des fils de polyamide aromatique et des fils de polyesters.

14. Coussinet pour presse selon la revendication 13 caractérisé en ce que la trame (A) comprend des fils de cuivre recouvert de silicone.

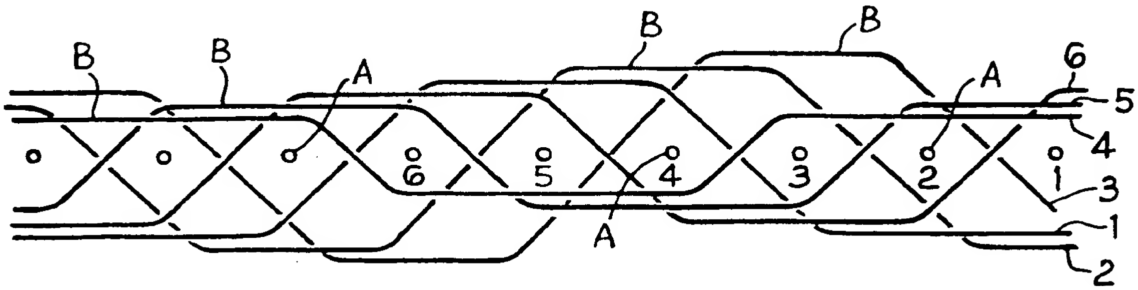

Fig. 3a

Fig. 3b

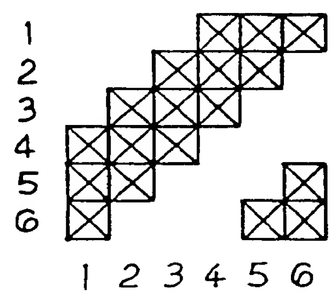

Fig. 4